

REMARKS

By the present amendment, independent claim 1 has been amended to further clarify the concepts of the present invention. More particularly, claim 1 has been amended to recite that the other vinyl monomer is at least one vinyl monomer selected from the group consisting of alkyl (meth)acrylates, aromatic vinyls, acrylonitrile and methacrylonitrile. Support for the amendment to claim 1 may be found in the disclosure at lines 6-11 of page six of the subject specification.

In addition, independent claim 11 has been added. Claim 11 includes the subject matter of present claim 9 and further recites that the other vinyl monomer is at least one vinyl monomer selected from the group consisting of alkyl (meth)acrylates, aromatic vinyls, acrylonitrile and methacrylonitrile. Entry of these amendments is respectfully requested.

In the Office Action, claims 1, 3 and 6 were rejected under 35 USC § 102(b) as being anticipated by the newly applied patent to Orikasa et al. In making this rejection, it was asserted that the cited patent teaches a composition which is obtained from a multi-step polymerization of (1) glycidyl methacrylate and (2) methyl methacrylate in the presence of (3) an initiator having a t-butyl peroxy group. In so doing, it apparently was asserted that (1) is the same as the (meth)acrylate having an oxygen atom in addition to an ester bond as recited in claim 1, (2) is the same as another alkyl acrylate as recited, and

(3) is the same as the polymerization initiator as recited. Reconsideration of this rejection in view of the above claim amendments and the following comments is respectfully requested.

Before discussing the rejection in detail, a brief review of the presently claimed invention may be quite instructive. The presently claimed invention relates to a processing aid for a thermoplastic resin, the processing aid being obtained by multi-step emulsion-polymerization of a specific (meth)acrylate, another alkyl acrylate and, optionally, another vinyl monomer copolymerizable therewith, in the presence of a polymerization initiator. The obtained processing aid has a particle structure as it is obtained by emulsion-polymerization. In addition, the processing aid, since it is obtained by multi-step emulsion polymerizing as described in Claim 1, has a core-shell structure. The processing aid of the present invention as obtained by multi-step emulsion polymerization of the above monomers provides a processing aid which yields excellent processability, in particular, provides properties such as a peeling property from a metal surface at a high temperature. It is submitted that such a processing aid is not taught or suggested by the cited patent to Orikasa et al.

The Orikasa et al patent discloses a multi-phase thermoplastic resin comprising an olefin copolymer having an epoxy group. In the disclosed process for preparing the multi-phase thermoplastic resin as set forth in Reference Example 1, the temperature is

increased in two phases, so that the reaction progresses in two phases. However, the disclosed process differs significantly from the multi-step emulsion-polymerization as used for the processing aid in accordance with the present invention and as defined in independent claim 1, 9 and 11, where the polymerization reaction is conducted by adding more monomer after the reaction of the first step is completed. Therefore, the processing aid of the present invention is distinctly different from the thermoplastic resin disclosed in the Orikasa et al patent in this important respect.

It is noted that, although several references were made in this rejection to the subject matter of claim 9 (requiring a mercaptan polymerization initiator), claim 9 was not specifically rejected over the Orikasa et al patent. In any regard, it was asserted that n-dodecylmercaptan as apparently disclosed in the cited patent corresponds to the mercaptan having an alkyl ester group as set forth in claim 9. However, n-dodecylmercaptan clearly does not have an alkylester group and therefore does not correspond to the chain transfer agent as presently claimed.

In summary, as described above, the Orikasa et al patent does not teach or suggest a processing aid prepared by a multi-step emulsion-polymerization as is presently claimed. Therefore, the processing aid of the present invention which has excellent processability and a peeling property from a metal surface at a high temperature cannot be obtained from the resin according to the Orikasa et al patent, since the patent does not teach or suggest,

among other things, a processing aid prepared by multi-step emulsion-polymerization.

For the reasons stated above, withdrawal of the rejections under 35 U.S.C. § 102(b) and allowance of claims 1, 3 and 6 as amended over the cited Orikasa et al patent are respectfully requested.

Claims 1, 3, 6 and 9 were rejected under 35 USC § 102(b) as being anticipated, or in the alternative, under 35 USC § 103(a), as being unpatentable over the newly cited patent to Kato et al. In making this rejection, it was asserted that the cited Kato et al patent teaches a composition which is formed in a multi-step polymerization from components which meet the recitations of independent claims 1 and 9 by teaching (1) glycidyl methacrylate and (2) butyl methacrylate. As in the above rejection, it apparently was asserted that (1) is the same as the (meth)acrylate having an oxygen atom in addition to an ester bond as recited in claim 1 and (2) is the same as another alkyl acrylate as recited. With respect to the polymerization initiator as set forth in claim 1, it was asserted that the patent teaches the use of t-butyl peroxide. With respect to the mercaptan chain transfer agent as recited in claim 9, it was asserted that the patent teaches mercaptans having an alkyl ester group as chain transfer agents such as dodecyl mercaptan. Reconsideration of this rejection in view of the above claim amendments and the following comments is respectfully requested.

Again, before discussing the subject rejection in detail, a brief review of the presently claimed invention as set forth in may be quite instructive. The above remarks relative to the invention as defined by independent claim 1 are reiterated herein. In accordance with the inventions as defined by claim 9 and newly added claim 11, a processing aid providing an excellent roll peeling property can be obtained by using a mercaptan containing an alkyl ester group having C₄₋₂₀ alkyl group as a chain transfer agent. In this regard, attention is directed to the composition of Example 8, which satisfies claim 9, where the roll peeling property is considerably improved to a value of 10. In distinct contrast, the compositions of Comparative Examples 8 and 9, where tert-dodecyl mercaptan and n-dodecyl mercaptan, which do not satisfy claim 9, are used, the roll peeling properties only have a value of 5. From this comparison, it is evident that the compositions of the presently claimed invention have an excellent roll peeling property. Thus, the processing aid of the presently claimed invention has excellent processability and, in particular, provides excellent properties such as a peeling from a metal surface at a high temperature. It is submitted that such a processing aid is not taught or suggested by the cited patent to Kato et al.

The Kato et al patent relates to a process for preparing impact-resistant MMA resin. In the disclosed process for preparing the resin according to the patent to Kato et al, an ethylene copolymer containing an epoxy group (B) is polymerized under high pressure condition of 50 to 4000 atmospheres in a first step and a MMA-type unsaturated monomer

mixture (A) and (B) are then emulsion polymerized in a second step. In Example 1, the ethylene copolymer containing an epoxy group (B) is polymerized under reaction conditions of a vessel temperature of 150°C and a pressure of 1500 kg/cm². Thus, the ethylene copolymer containing an epoxy group (B) is not obtained by multi-step emulsion polymerization as asserted in the Action. Specifically, the reliance in the Action was misplaced as the cited disclosure is directed to the polymerization of copolymer (A), rather than the polymerization of copolymer (B) which being applied against the subject claims. Therefore, the Kato et al patent does not teach that the ethylene copolymer containing an epoxy group (B) is emulsion polymerized and further the patent does not teach or suggest multi-step emulsion polymerization as presently claimed in independent claims 1, 9 and 11.

It is further submitted that the chain transfer agent dodecyl mercaptan as disclosed the Kato et al patent at lines 17-22 of column 5, and relied upon in the Action, does not correspond to a mercaptan having an alkyl ester group as is clearly recited in claim 9. Dodecyl mercaptan does not have an alkyl ester group. Claim 9 recites "a mercaptan having an alkyl ester group with C₄₋₂₀ alkyl group as a chain transfer agent.

Furthermore, it is disclosed in the Kato et al patent that the dodecyl mercaptan chain transfer agent is used in preparing monomer mixture (A) as described above. Specifically, in both cited instances, the chain transfer agent was being used in connection with the polymerization of copolymer (A) rather than copolymer (B) which is being applied against

the subject claim. That is, there is no disclosure of the use of the dodecyl mercaptan chain transfer agent in preparing the ethylene copolymer containing an epoxy group (B).

For the reasons stated above, withdrawal of the rejection under 35 U.S.C. § 103(a) and allowance of claims 1, 3, 6, 9 and 11 over the cited Kato et al patent are respectfully requested.

In view of the foregoing, it is submitted that the subject application is now in condition for allowance and early notice to that effect is earnestly solicited.

In the event this paper is not timely filed, the undersigned hereby petitions for an appropriate extension of time. The fee for this extension may be charged to Deposit Account No. 01-2340, along with any other additional fees which may be required with respect to this paper.

Respectfully submitted,

ARMSTRONG, KRATZ, QUINTOS, HANSON & BROOKS, LLP



Donald W. Hanson
Attorney for Applicants
Reg. No. 27,133

Atty. Docket No. 011080
Suite 1000, 1725 K Street, N.W.
Washington, D.C. 20006
(202) 659-2930
DWH/rab



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